

Amendments to the Claims:

In the Claims:

Claims

- 1 (Currently amended) A method for automatic alignment of tilt series (~~2-i~~) in an electron microscope, comprising:
 - * applying markers (~~8-i~~) to a sample (~~2~~) to be imaged by the electron microscope;
 - * providing a tilt series of images (~~2-i~~) of the sample;
 - * identifying a first set of candidate markers (~~8-i~~) in each of the images in the tilt series;
 - * attributing at least one probability parameter to each candidate marker in each image;characterized in that the method further comprises:
 - * selecting a second set (~~16-i~~) as a subset of candidate markers from the first set of candidate markers on the basis of said at least one probability parameter;
 - * projecting the candidate markers in the second set onto a sole image;
 - * applying a fitting algorithm to determine a set of parallel straight lines or very elongate ellipses (~~20-i~~) best fitting the candidate markers in the sole image;
 - * aligning the images in the tilt series on the basis of the identified candidate markers.
- 2 (Original) A method according to Claim 1 in which the fitting algorithm used to determine the set of parallel straight lines comprises the Hough transformation.
- 3 (Original) A method according to Claim 1 in which the fitting algorithm used to determine the set of parallel straight lines or to determine a set of very elongate ellipses is constituted by the Generalized Hough transformation.

- 4 (Original) A method according to Claim 1 in which, before identifying candidate markers in each of the images in the tilt series, a cross correlation process is applied to the images of the tilt series.
- 5 (Currently amended) A method according to ~~any of the preceding Claims~~ Claim 1 in which the probability parameter is derived from at least one of the quantities: size of the marker and local contrast of the marker.
- 6 (Currently amended) A method according to Claim 2 in which the fitting algorithm further comprises:
- * deriving for each candidate marker a sine-shaped curve (~~24~~) based on the co-ordinates of the corresponding candidate marker, according to the Hough transformation;
 - * deriving from the sine-shaped curves a number of histograms (~~fig.4~~) indicating, for each direction (~~a~~), the relation between the density of candidate markers and the line distance parameter (~~r~~) according to the Hough transformation;
 - * applying an entropy (~~S~~) operation to each of the histograms, resulting in a set of entropy parameters (~~S_i~~), one entropy parameter for each histogram;
 - * establishing the minimum value in the set of entropy parameters;
 - * identifying the histogram corresponding to said minimum value as the one showing the highest degree of peak diversity;
 - * selecting from the latter histogram a number of peaks;
 - * deriving from each peak position in the histogram the corresponding line distance parameter according to the Hough transformation.
- 7 (New) A method according to Claim 2 in which the probability parameter is derived from at least one of the quantities: size of the marker and local contrast of the marker.
- 8 (New) A method according to Claim 3 in which the probability parameter is derived from at least one of the quantities: size of the marker and local contrast of the marker.

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- 9 (New) A method according to Claim 4 in which the probability parameter is derived from at least one of the quantities: size of the marker and local contrast of the marker.